

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (currently amended) An antibody fragment comprising a Fab or Fab' fragment to which that has been modified by attachment of at least one effector molecule ~~is attached~~ ~~characterized in that~~ wherein the heavy chain in the fragment is not covalently bonded to the light chain, and both the interchain cysteine of C_L and the interchain cysteine of C_H1 have been replaced with another amino acid.
2. (original) The antibody fragment of claim 1 wherein the interchain cysteine of C_L and the interchain cysteine of C_H1 have been replaced with a non-thiol containing amino acid.
3. (original) The antibody fragment of claim 2 wherein the interchain cysteine of C_L has been replaced with serine.
4. (original) The antibody fragment of claim 2 wherein the interchain cysteine of C_H1 has been replaced with serine.
5. (original) The antibody fragment of claim 2 wherein both the interchain cysteine of C_H1 and the interchain cysteine of C_L have been replaced with serine.
6. (currently amended) The antibody fragment of ~~claims 1-5~~ claim 1 wherein the interchain cysteine of C_L is at position 214 of the light chain and the interchain cysteine of C_H1 is at position 233 of the heavy chain.
7. (currently amended) The antibody fragment of ~~claims 1-6~~ claim 1 ~~where~~ wherein at least one effector molecule is attached to the heavy or light chain constant region of the fragment.
8. (currently amended) The antibody fragment of ~~claims 1-7~~ claim 1, wherein an effector molecule is attached to a cysteine in the light chain constant region and to a cysteine in the heavy chain constant region of the fragment.

9. (original) The antibody fragment of claim 8, wherein the cysteine residues in the heavy and light chain constant regions which are attached to effector molecules would otherwise be linked to each other via a disulphide bond if the effector molecules were not attached.
10. (currently amended) ~~An~~ The antibody Fab' fragment according to claims 1-9 of claim 1 wherein the fragment is a Fab' fragment that contains a modified hinge region.
11. (currently amended) ~~An antibody Fab' fragment according to claim 10 in which~~ The antibody fragment of claim 10 wherein the modified hinge region contains 1 cysteine residue.
12. (currently amended) ~~An antibody Fab' fragment according to claim 11 in which~~ The antibody fragment of claim 11 wherein the modified hinge region comprises the sequence in
of SEQ ID NO:1 or SEQ ID NO:2.
13. (currently amended) ~~The antibody fragment of claim 10 in which~~ The antibody fragment of claim 10 wherein the modified hinge region contains 2 cysteine residues.
14. (currently amended) ~~An antibody Fab' fragment according to claim 13 in which~~ The antibody fragment of claim 10 wherein the modified hinge region comprises the sequence in
of SEQ ID NO:3 or SEQ ID NO:4.
15. (currently amended) ~~An~~ The antibody Fab' fragment according to claims 1-14 where
of claim 1 wherein the fragment is a Fab' fragment in which at least one effector molecule is
attached to the hinge region of the fragment.
16. (currently amended) ~~An antibody Fab' fragment according to~~ The antibody fragment
of claim 15 in which two effector molecules are attached to the hinge region of the fragment.

17. (currently amended) ~~An~~ The antibody Fab' fragment ~~according to claims 1-16 of~~
claim 1 wherein the fragment is a Fab' fragment in which all the each effector molecules
molecule attached to the fragment ~~are~~ is attached to the hinge region of the fragment.
18. (currently amended) ~~An~~ The antibody Fab' fragment ~~according to claims 1-17 of~~
claim 1 in which the fragment is a Fab' fragment in which each effector molecule attached to
the fragment is attached to a cysteine in the hinge region of the fragment.
19. (currently amended) A method of producing an antibody Fab or Fab' fragment
~~according to claims 1-18 to which at least one effector molecule is attached~~ comprising:
a. treating an antibody Fab or Fab' fragment in which both the interchain
cysteine of C_L and the interchain cysteine of C_H1 have been replaced with
another amino acid with a reducing agent capable of generating at least one
free thiol group in the fragment; and
b. reacting the treated fragment with an effector molecule.
20. (currently amended) The method ~~according to~~ of claim 19 ~~in which wherein~~ the
~~reductant~~ reducing agent is a non-thiol based ~~reductant~~ reducing agent.
21. (currently amended) The method ~~according to~~ of claim 20 ~~in which wherein~~ the
~~reductant~~ reducing agent is a trialkylphosphine.
22. (currently amended) The method ~~according to~~ of claim 21 ~~in which wherein~~ the
trialkylphosphine ~~reductant~~ reducing agent is tris(2-carboxyethyl)phosphine (TCEP).
23. (currently amended) The method ~~according to~~ of ~~claim 22~~ claim 21 ~~in which wherein~~
the trialkylphosphine ~~reductant~~ reducing agent is tris(3-hydroxypropyl)phosphine (THP).
24. (currently amended) The method ~~according to~~ of ~~claim 23~~ claim 19 ~~in which wherein~~
either or both of steps (a) and (b) are performed in the presence of a chelating agent.

25. (currently amended) The method ~~according to~~ of claim 24 ~~in which~~ wherein the chelating agent is EDTA.

26. (currently amended) The method ~~according to~~ of claim 25 ~~in which~~ wherein both steps (a) and (b) are performed in the presence of EDTA.

27. (currently amended) A composition comprising a mixture containing ~~of~~ two or more antibody Fab or Fab' fragments, characterized in that wherein the mixture is enriched for Fab or Fab' fragments in which the light ~~chain~~ chains in said fragments ~~is~~ are not covalently bonded to the heavy ~~chain~~ chains, both the interchain cysteines of C_L and C_{H1} have been replaced by another amino acid, and at least one effector molecule is attached to the ~~fragment~~ fragments.

28. (currently amended) ~~A~~ The mixture composition according to ~~of~~ claim 27 ~~in which~~ wherein greater than 50% of the mixture comprises a Fab or Fab' ~~fragment~~ fragments in which the light ~~chain~~ chains in said ~~fragment~~ fragments ~~is~~ are not covalently bonded to the heavy ~~chain~~ chains, both the interchain cysteines of C_L and C_{H1} have been replaced by another amino acid, and at least one effector molecule is attached to the ~~fragment~~ fragments.

29. (currently amended) The antibody fragment of ~~claims 1-28~~ claim 1 wherein the effector molecule is PEG.

30. (currently amended) A pharmaceutical composition comprising an antibody fragment ~~according to any of the preceding claims of claim 1~~, together with one or more pharmaceutically acceptable excipients, diluents, or carriers.